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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/940,932	08/29/2001	Naruhito Kondo	016887-1049	7231

22428 7590 02/27/2003

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EXAMINER

NICOLAS, WESLEY A

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 02/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/940,932

Applicant(s)

KONDO ET AL.

Examiner

Wesley A. Nicolas

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 17-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 17-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 69/393,317
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-7 and 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilchrist (5,322,545), and further in view of Tomczuk et al. (5,009,752).

Gilchrist teaches an apparatus and method of treating electrically conductive nuclear fuel materials, which comprises:

- a filtering unit and process for filtering the molten salt used in the molten salt electrolysis process (Fig. 1, numeral 46) to extract the nuclear fuel materials removed from the material and accumulated in the molten salt from the molten salt (Fig. 1, numeral 31);

- a molten salt return line (Fig. 1, numeral 37) wherein the molten salt filtered in the filtering process (Fig. 1, numeral 32) is reused in the molten salt electrolysis process (Fig. 1, numerals 22 and 43).

Gilchrist fails to specifically teach a method or apparatus for removing the nuclear fuel materials adhering to a surface of the waste by immersing the waste in a molten salt to dissolve a surface layer of the waste electrochemically in the molten salt (*i.e.* cladding and nuclear fuel), or of a basket which holds the fuel and acts as an electrode.

Tomczuk et al. teaches a method and apparatus for removing the nuclear fuel materials adhering to a surface of the waste by immersing the waste in a molten salt to dissolve a surface layer (*i.e.* cladding) of the waste electrochemically in the molten salt contaminated with nuclear fuels materials (col. 2, lines 11-35), and of a basket which holds the fuel and acts as an electrode (col. 4, line 65 to col. 5, line 4).

Claims 1 and 17 are rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified Gilchrist to remove the nuclear fuel materials adhering to a surface of the waste (*i.e.* cladding) by immersing the waste in a molten salt to dissolve a surface layer of the waste electrochemically in the molten salt as taught by Tomczuk et al. because Tomczuk et al. teach that the cladding on the nuclear fuel materials is removed by placing the nuclear fuel materials and the waste in an anode basket and electrochemically removing said waste from the nuclear fuel materials (col. 4, line 65 to col. 5, line 4) which would have

reduced the number of steps needed to reclaim the pure nuclear fuel materials, thereby increasing the overall efficiency of the method and apparatus.

Although Gilchrist does not teach a cleaning process for removing molten salt adhering to the waste, claims 2-3 and 18-19 are rejected because Gilchrist does however teach of an evaporation/cleaning process (*i.e.* distillation) for removing the molten salt adhering to a surface of the nuclear fuel material (Fig. 1, numeral 34: "Distillation") and therefore, it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified said evaporation/cleaning process to remove the molten salt adhering to the waste because Gilchrist teaches that said evaporation/cleaning process allows the recycle of said molten salt (Fig. 1, numeral 37) thereby increasing the overall efficiency of the method and apparatus.

Claims 4-7 and 20-23 are rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified Gilchrist to move the molten salt and the waste (with nuclear fuel materials) relative to each other and in a basket as taught by Tomczuk et al. because Tomczuk et al. teach of placement of the waste in an anode basket which is then rotated in a molten electrolyte (col. 4, lines 33-37) wherein electrolyte can be spouted against the waste (col. 2, line 62 to col. 3, line 6) which increases the contact surface area and movement of the waste relative to the molten electrolyte, thereby providing for more efficient removal of the cladding. Although Gilchrist and Tomczuk et al. fail to specifically teach of vibration, the use of vibration to clean and remove contaminants (*i.e.* dirt from jewelry) would have been well known to one having ordinary skill in the art.

4. Claims 8 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Gilchrist - Tomczuk et al. combination, as applied to claims 1 and 17 above, and further in view of Poa et al. (5,225,051).

The Gilchrist - Tomczuk et al. combination are as applied, argued, and disclosed above and incorporated herein but fail to specifically teach of a liquid metal electrode.

Poa et al. teach the use of a liquid metal electrode in a process for reclaiming nuclear fuel materials (col. 2, lines 35-39).

Claims 8 and 24 are rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified the Gilchrist - Tomczuk et al. combination to use a liquid metal electrode as taught by Poa et al. because Poa et al. teaches the use of a liquid metal electrode (col. 2, lines 35-39) which provides efficient contact with the material (*i.e.* basket) even if the pore sizes are small (col. 2, lines 22-39) thereby increasing the overall efficiency of the method and apparatus.

5. Claims 9-12 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Gilchrist - Tomczuk et al. combination, as applied to claims 1 and 17 above, and further in view of Pierce et al. (5,160,367).

The Gilchrist - Tomczuk et al. combination are as applied, argued, and disclosed above and incorporated herein but fail to specifically teach that the nuclear fuel

materials are oxides or of a reducing process for reducing the nuclear fuel materials to metals before subjecting the waste to a molten electrolysis process.

Pierce et al. teach of a reducing process for reducing the oxide nuclear fuel materials to metals before subjecting the waste to a molten electrolysis process (Fig. 1a, "oxide fuel reducer").

Claims 9-12 and 25 are rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified Gilchrist to use an oxide fuel reducer as taught by Pierce et al. because Pierce et al. teach of an oxide fuel reducer (Fig. 1a, "oxide fuel reducer") which reduces the nuclear fuel materials to metals by reacting the nuclear fuel materials react with a reducing agent (col. 2, lines 45-60: "...oxides are reduced by reaction with the liquid calcium to form calcium oxide...") before subjecting the waste to the molten salt electrolysis where a voltage is applied that will not cause a decomposition of the reducing molten salt across an anode and cathode (col. 3, lines 55-65) thereby allowing efficient separation of the nuclear fuel and the other materials.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley Nicolas whose telephone number is (703)305-0082. The examiner can normally be reached on Mon.-Thurs. from 7am to 5pm.

The Supervisory Primary Examiner for this Art Unit is Roy King whose telephone number is (703) 308-1146.

The fax number for this Group is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.



Wesley Nicolas

February 24, 2003